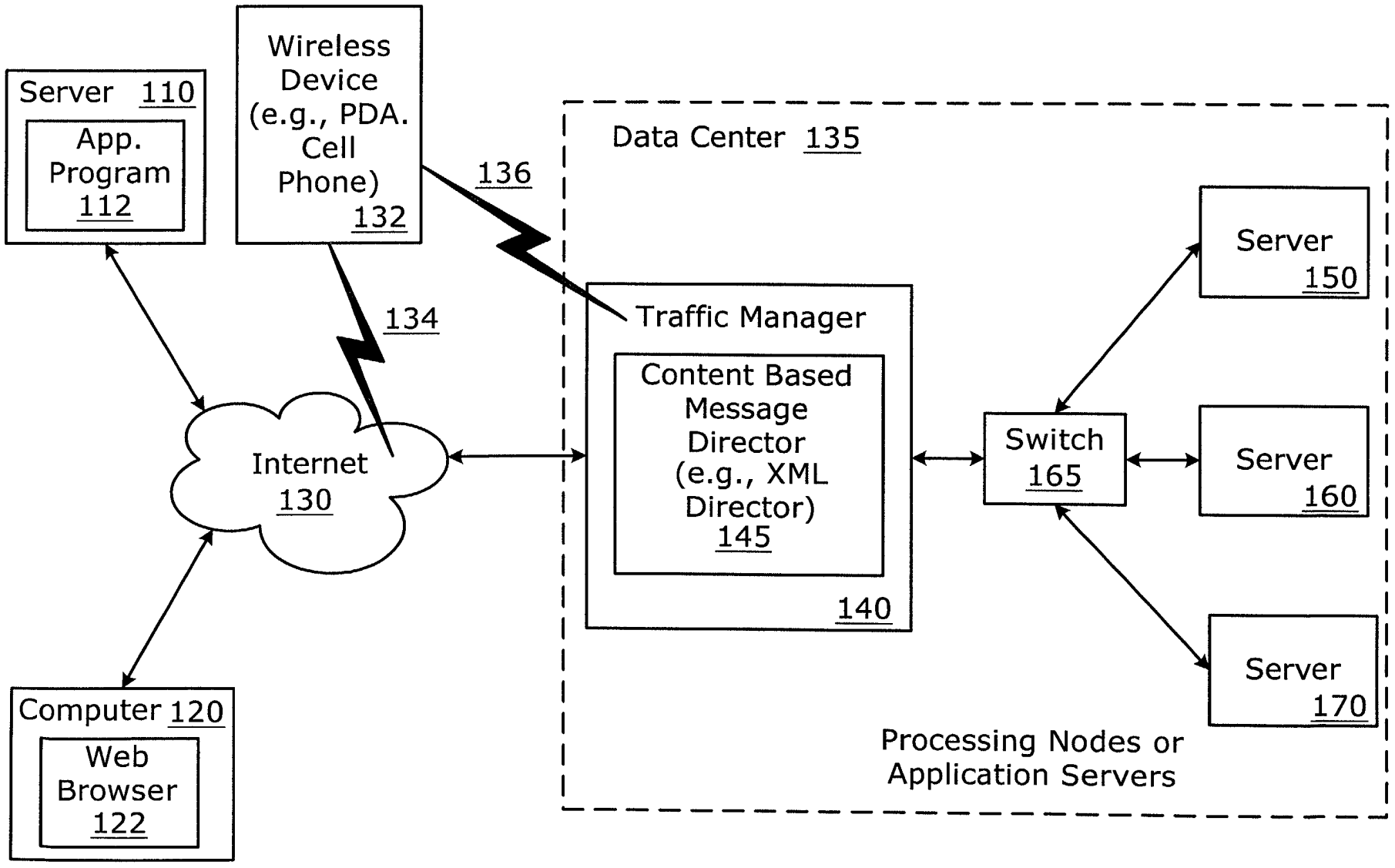

Server 110
App. Program 112
Wireless Device (e.g., PDA. Cell Phone) 132
136
134
Data Center 135
Traffic Manager
Content Based Message Director (e.g., XML Director) 145
140
Server 150
Switch 165
Server 160
Server 170
Internet 130
Computer 120
Web Browser 122
Processing Nodes or Application Servers
Clients

FIG. 1

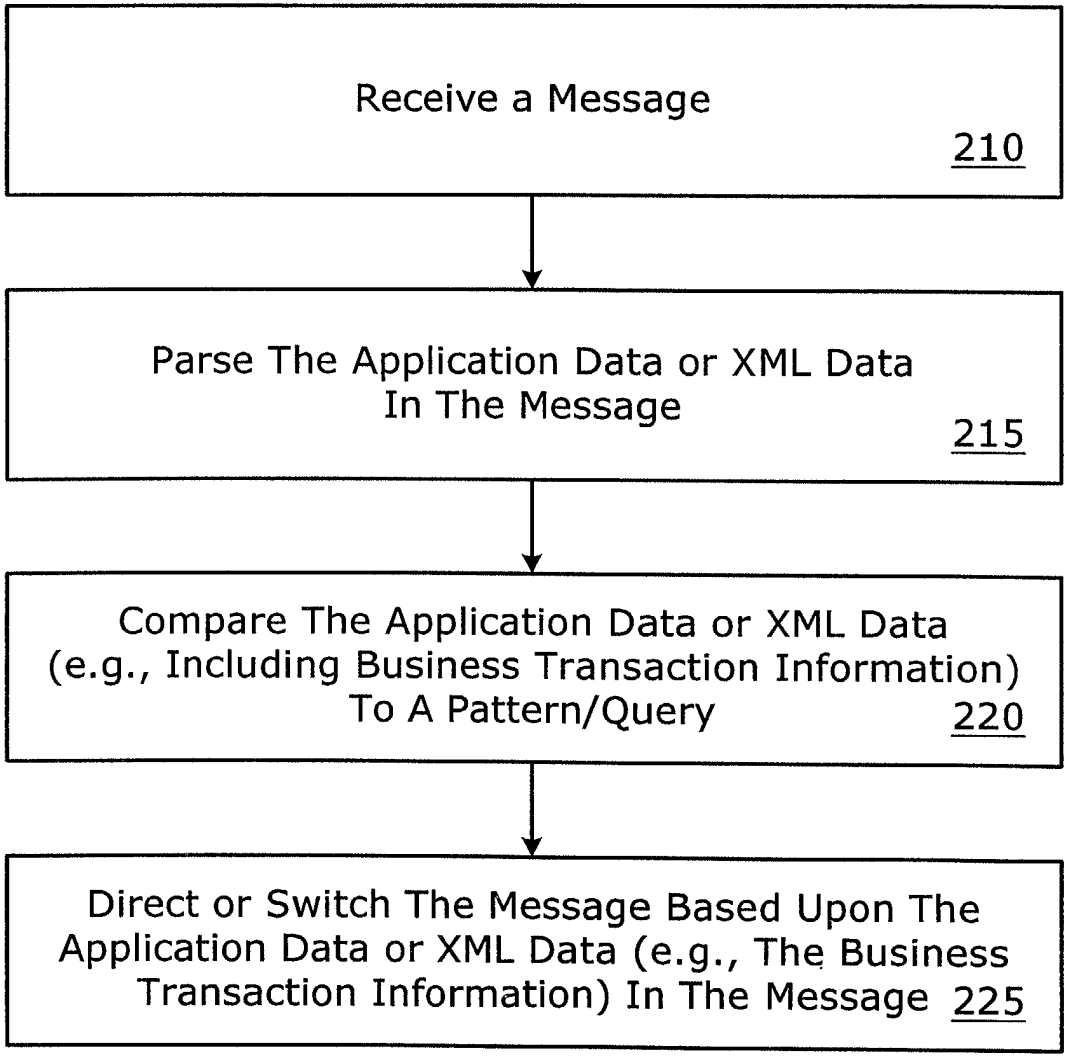

Receive a Message
210
Parse The Application Data or XML Data In The Message
215
Compare The Application Data or XML Data (e.g., Including Business Transaction Information) To A Pattern/Query
220
Direct or Switch The Message Based Upon The Application Data or XML Data (e.g., The Business Transaction Information) In The Message
225

FIG. 2

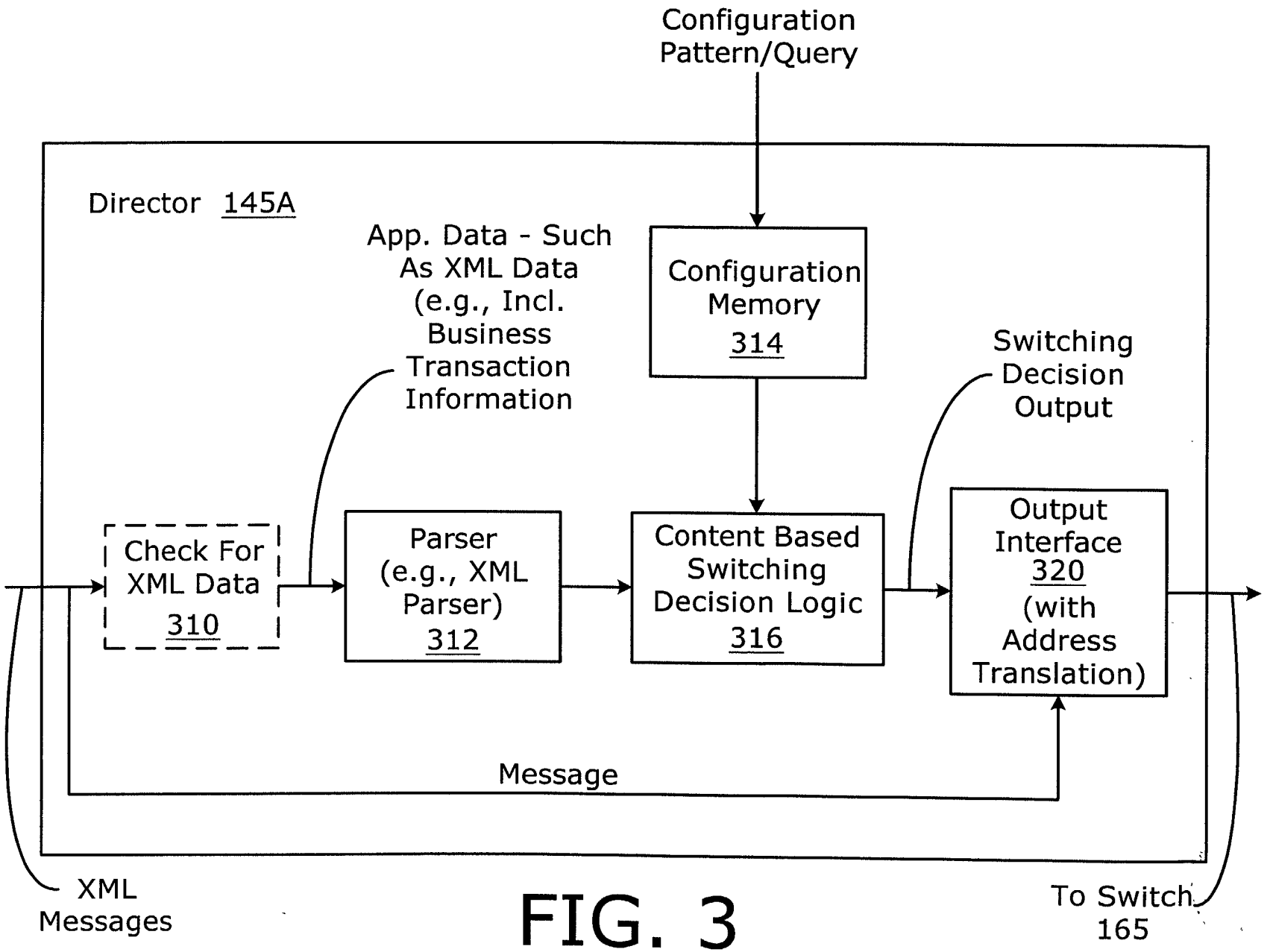

Configuration Pattern/Query
Director 145A
App. Data - Such As XML Data (e.g., Incl. Business Transaction Information
Configuration Memory 314
Switching Decision Output
Check For XML Data 310
Parser (e.g., XML Parser) 312
Content Based Switching Decision Logic 316
Output Interface 320 (with Address Translation)
Message
XML Messages
To Switch 165

FIG. 3

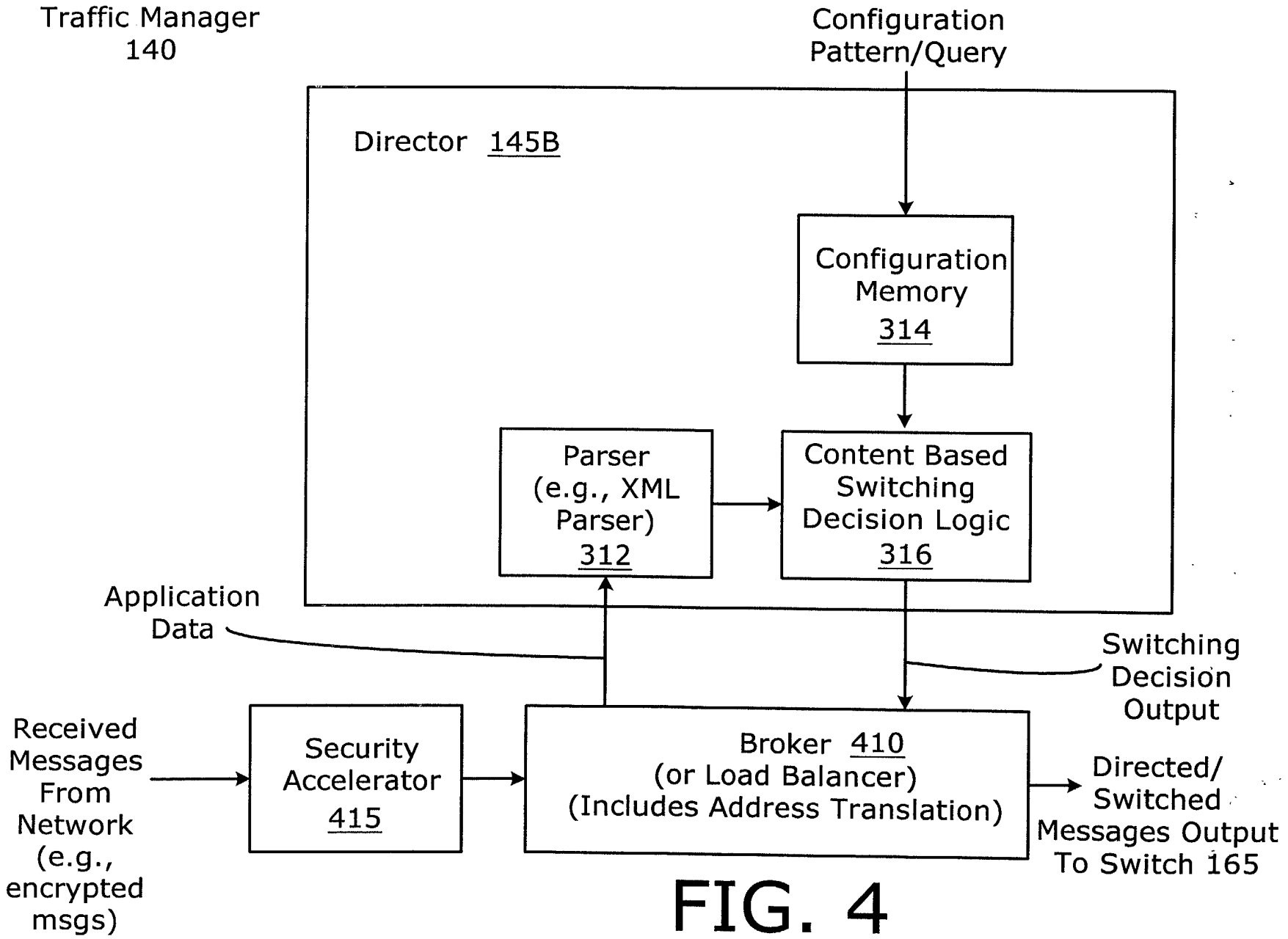

Traffic Manager
140
Configuration
Pattern/Query
Director 145B
Configuration
Memory
314
Parser
(e.g., XML
Parser)
312
Content Based
Switching
Decision Logic
316
Application
Data
Switching
Decision
Output
Received
Messages
From
Network
(e.g.,
encrypted
msgs)
Security
Accelerator
415
Broker 410
(or Load Balancer)
(Includes Address Translation)
Directed/
Switched
Messages Output
To Switch 165

FIG. 4

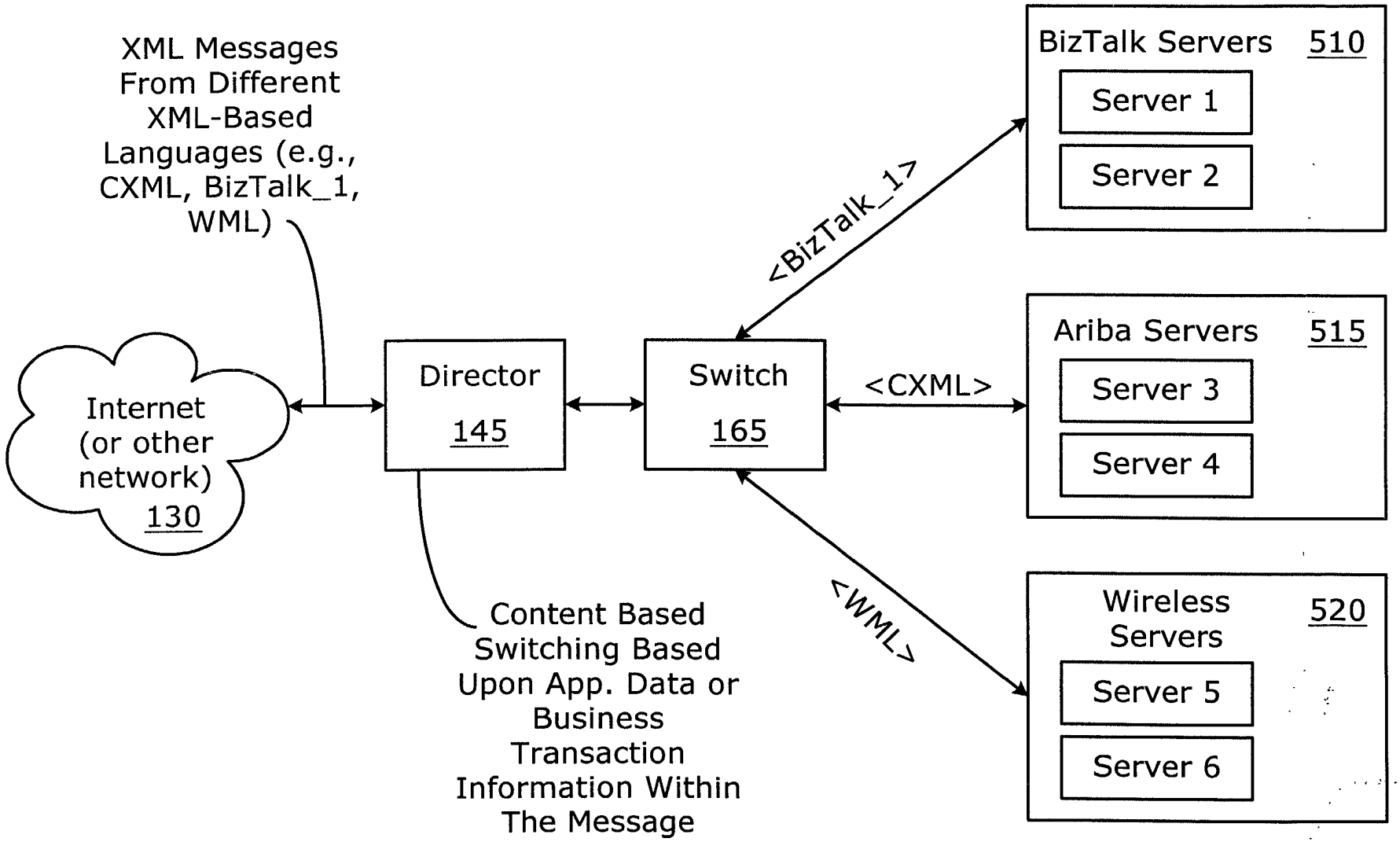
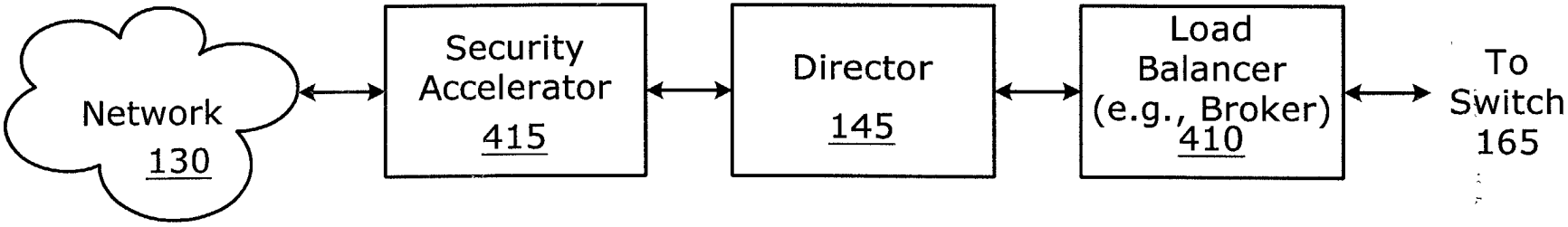

XML Messages From Different XML-Based Languages (e.g., CXML, BizTalk_1, WML)
Internet (or other network) 130
Director 145
Switch 165
<BizTalk_1>
<CXML>
<WML>
BizTalk Servers 510
Server 1
Server 2
Ariba Servers 515
Server 3
Server 4
Wireless Servers 520
Server 5
Server 6
Content Based Switching Based Upon App. Data or Business Transaction Information Within The Message

FIG. 5




Network
Apparatus

FIG. 6

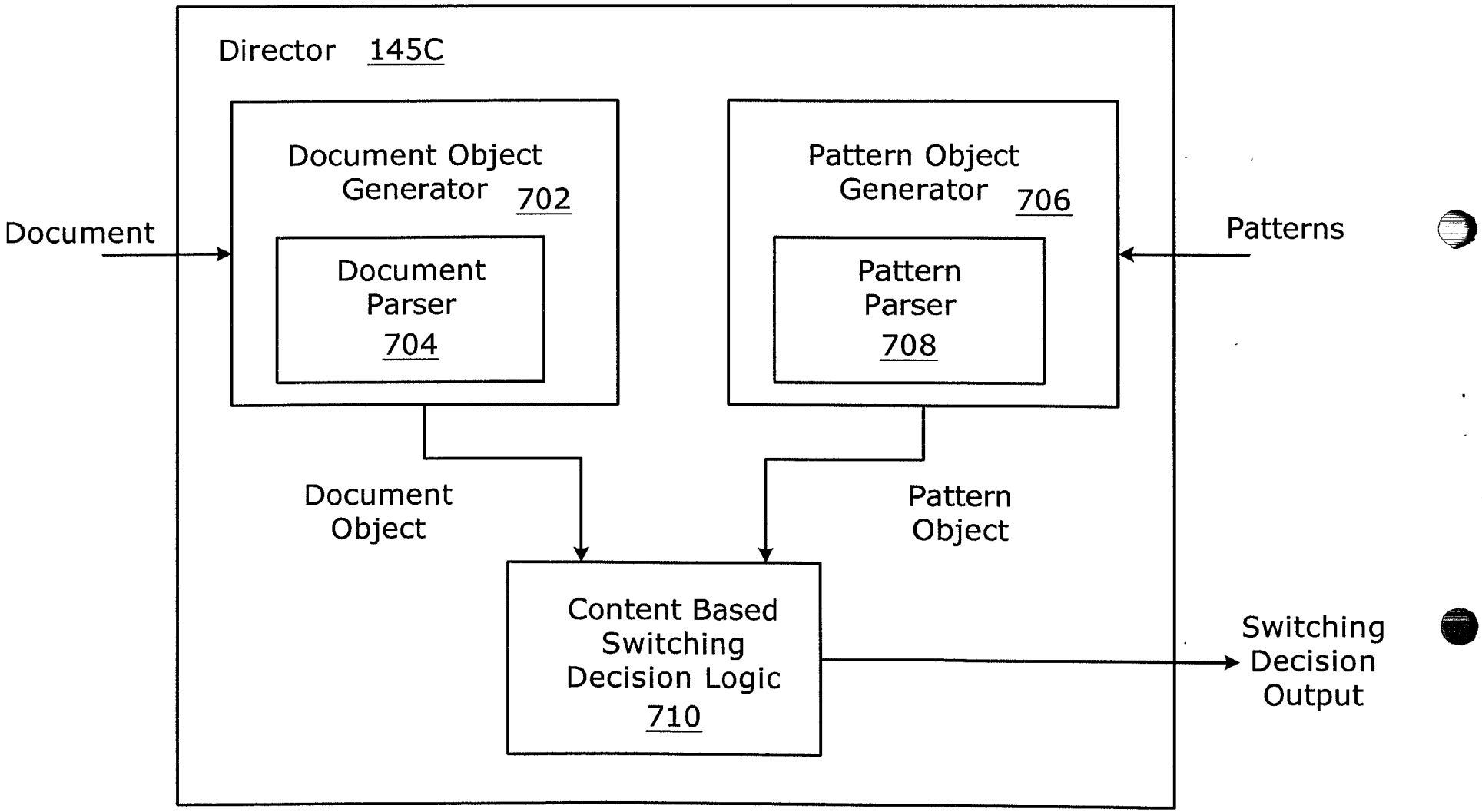

Director 145C
Document Object Generator 702
Document Parser 704
Pattern Object Generator 706
Pattern Parser 708
Document
Patterns
Document Object
Pattern Object
Content Based Switching Decision Logic 710
Switching Decision Output

FIG. 7

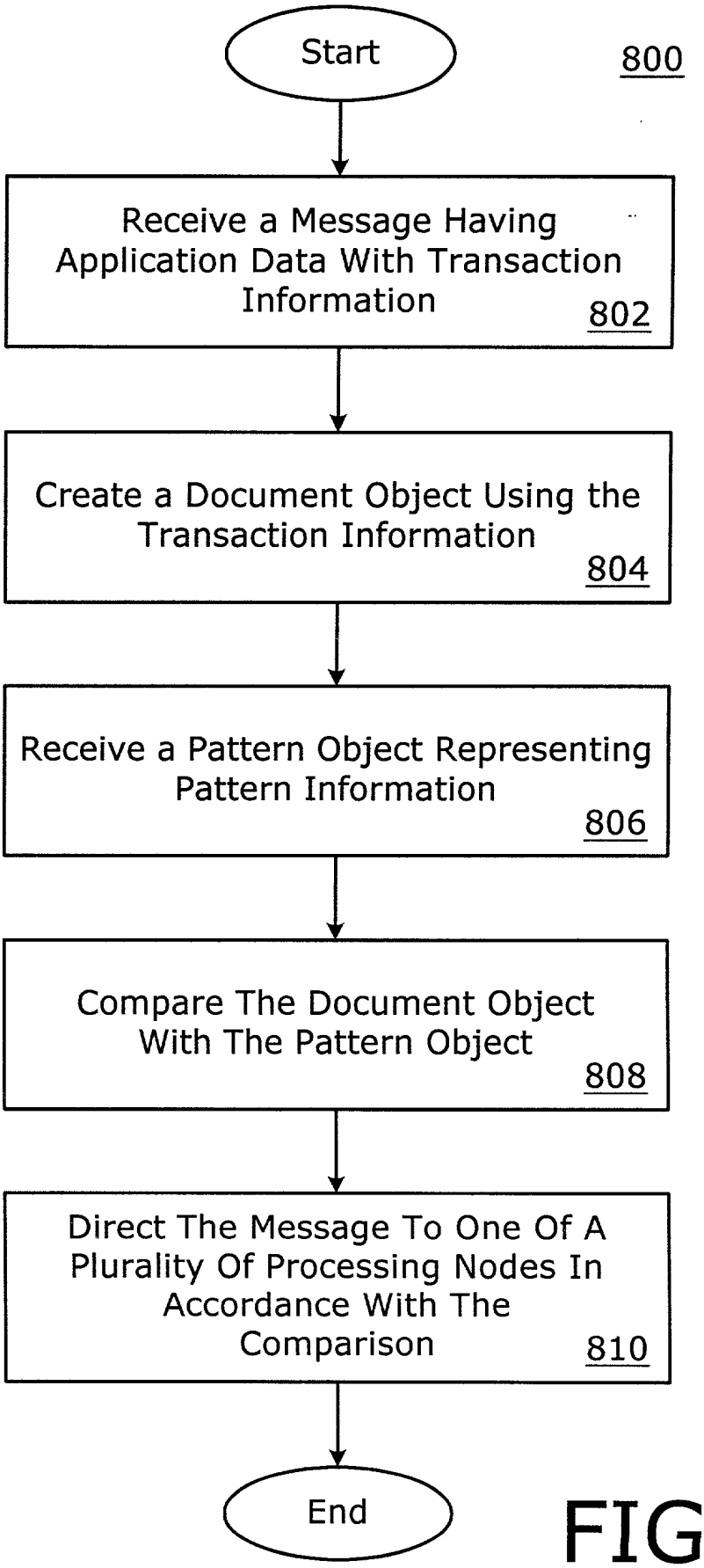

Start
800
Receive a Message Having Application Data With Transaction Information
802
Create a Document Object Using the Transaction Information
804
Receive a Pattern Object Representing Pattern Information
806
Compare The Document Object With The Pattern Object
808
Direct The Message To One Of A Plurality Of Processing Nodes In Accordance With The Comparison
810
End

FIG. 8

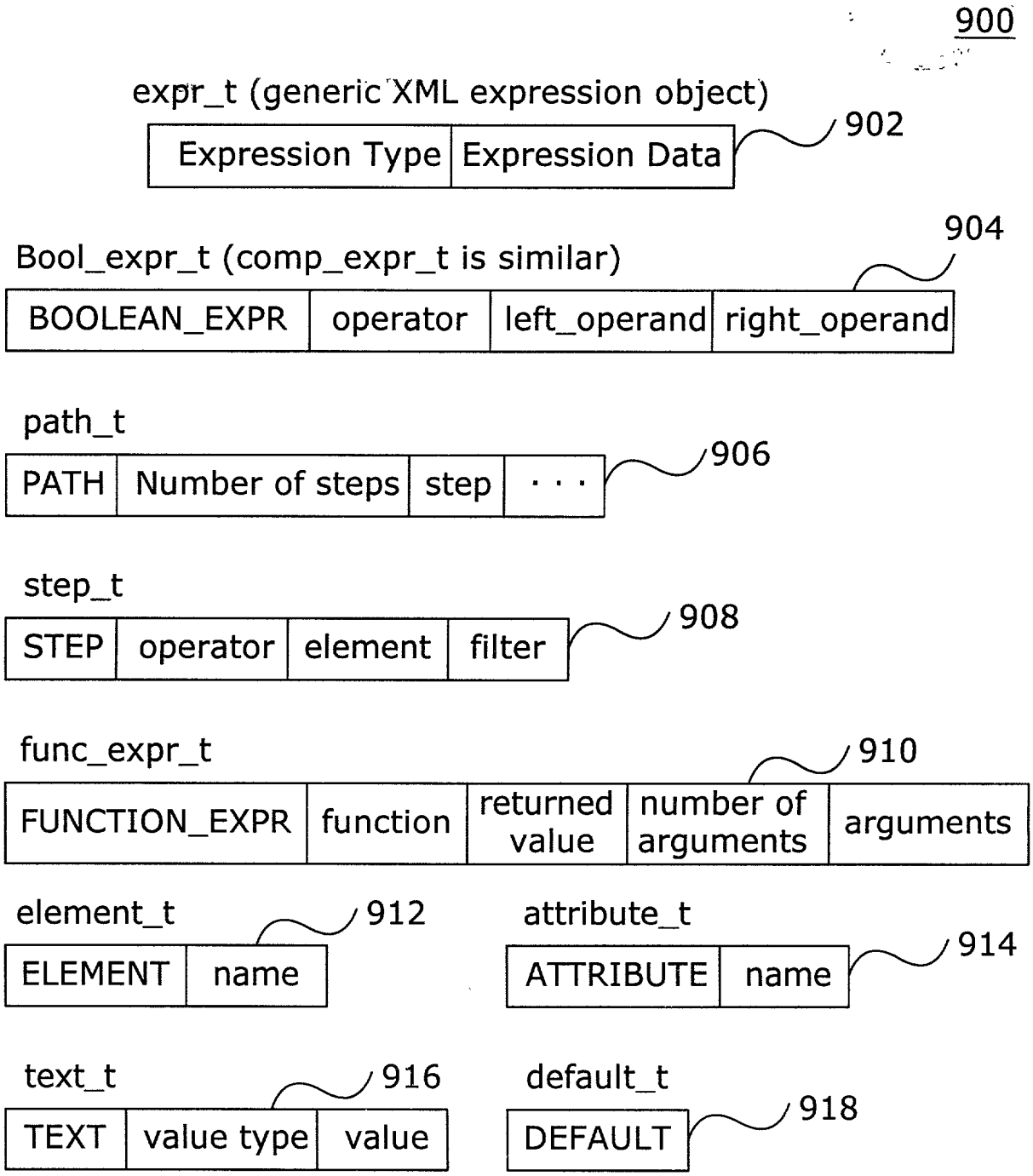

900
expr_t (generic XML expression object)
Expression Type
Expression Data
902
Bool_expr_t (comp_expr_t is similar)
904
BOOLEAN_EXPR
operator
left_operand
right_operand
path_t
PATH
Number of steps
step
· · ·
906
step_t
STEP
operator
element
filter
908
func_expr_t
910
FUNCTION_EXPR
function
returned value
number of arguments
arguments
element_t
912
ELEMENT
name
attribute_t
914
ATTRIBUTE
name
text_t
916
TEXT
value type
value
default_t
DEFAULT
918

FIG. 9

1000

XML Pattern: //Employee/Name[@LastName= "Smith" and @Inital]

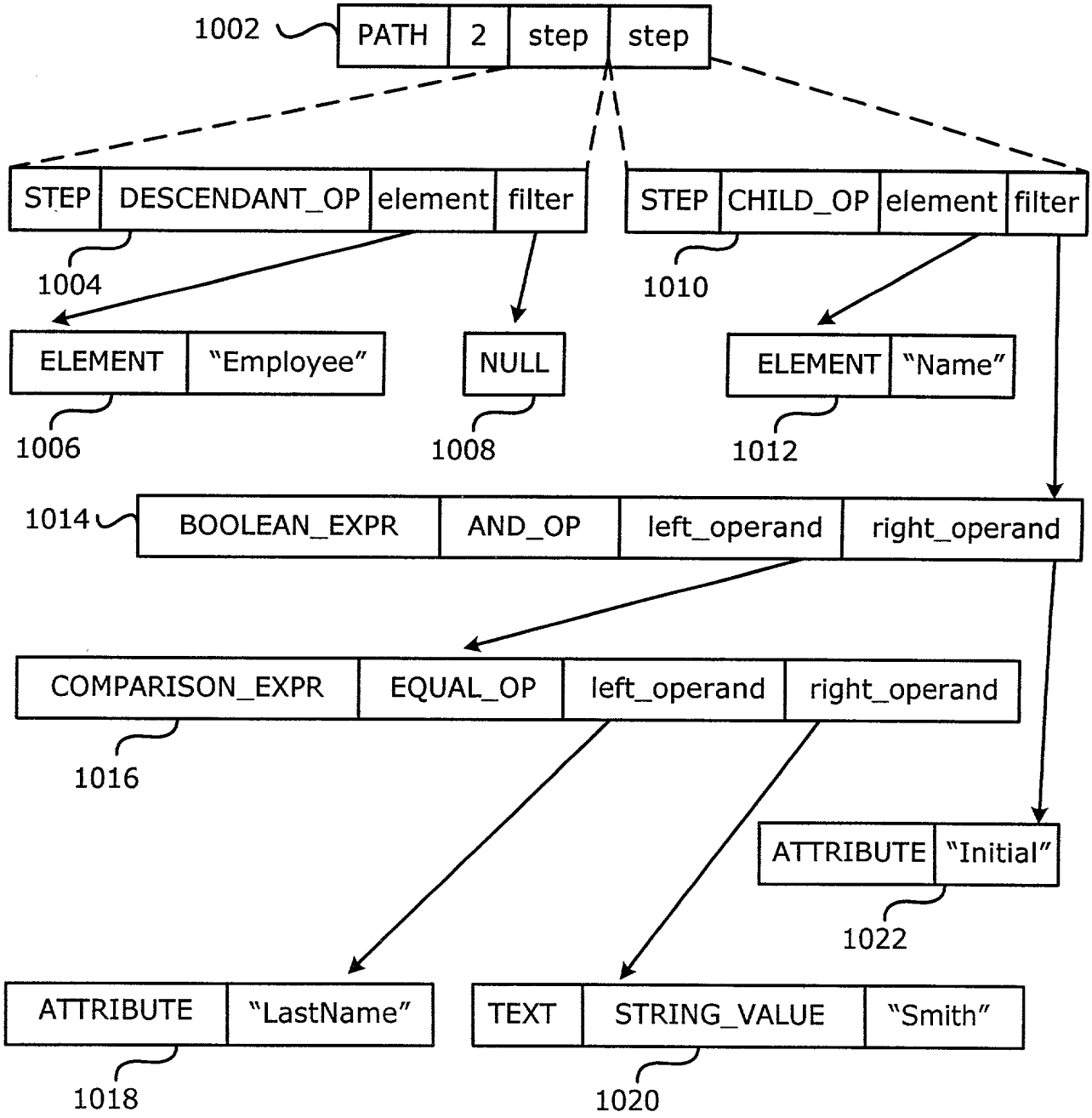



FIG. 10

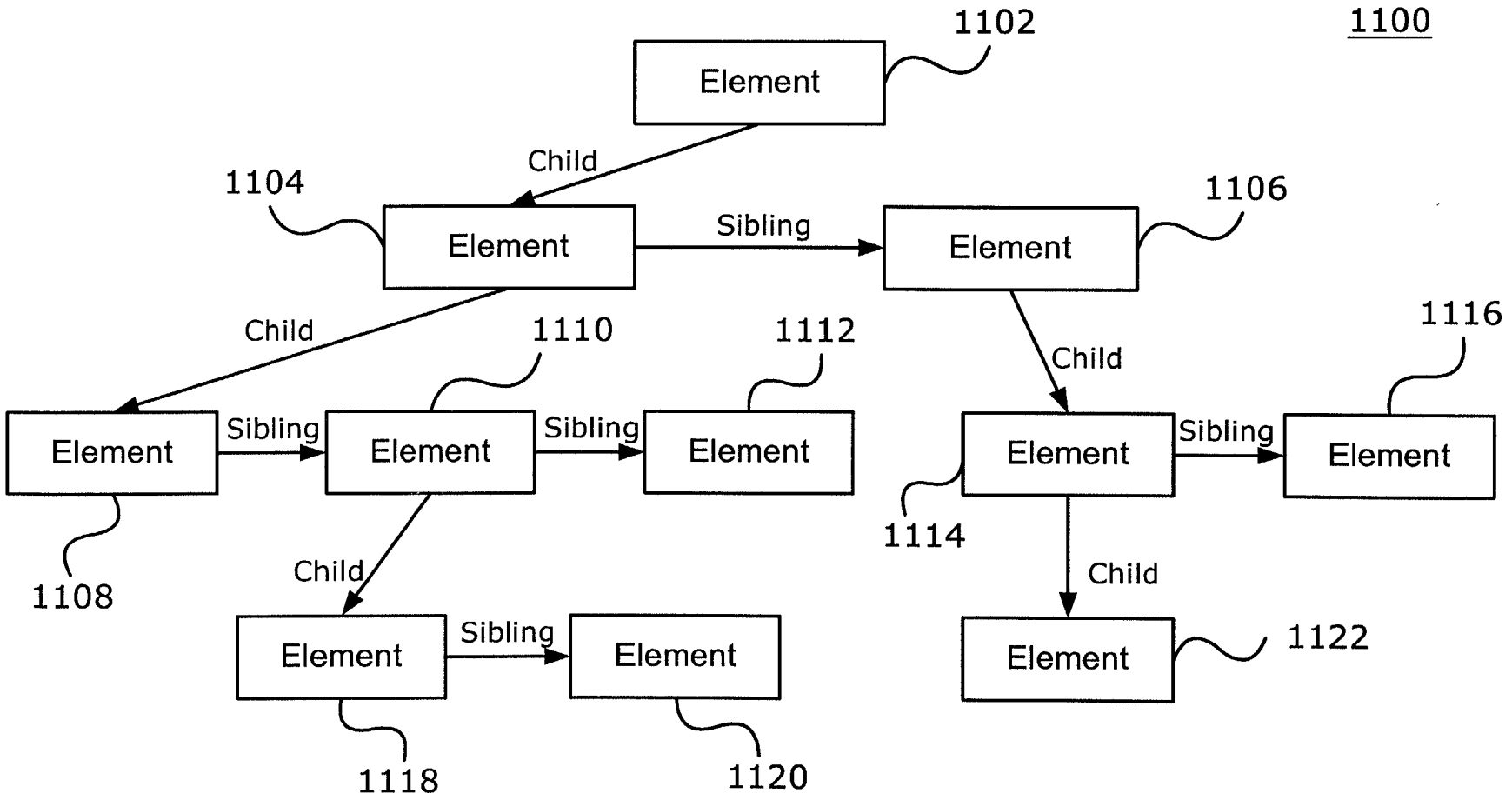

1100
1102
Element
Child
1104
Element
Sibling
1106
Element
Child
1110
1112
Element
Sibling
Element
Sibling
Element
1108
Child
Element
Sibling
Element
1118
1120
Child
1116
Element
Sibling
Element
1114
Child
Element
1122

FIG. 11

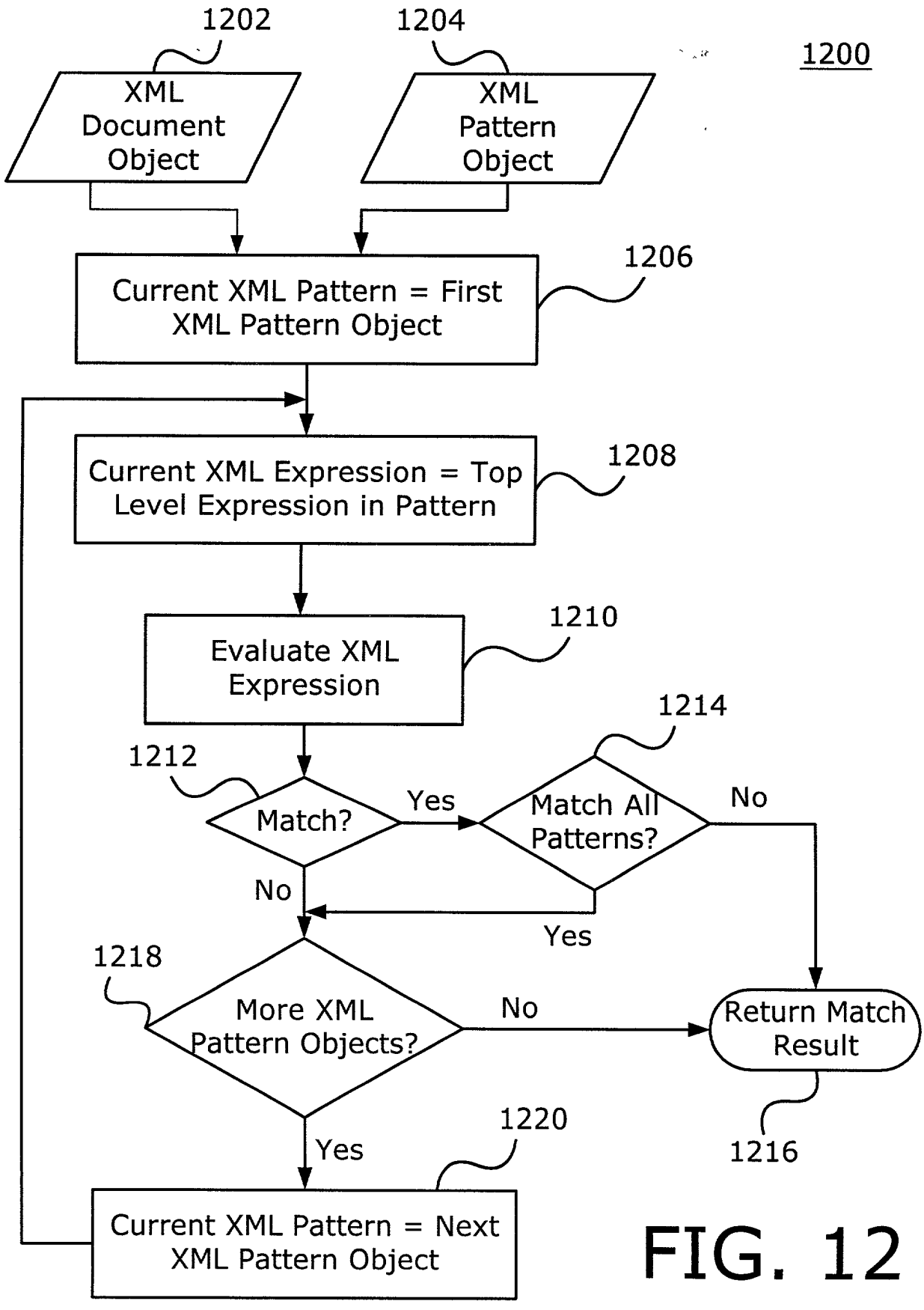

1200
1202
XML Document Object
1204
XML Pattern Object
1206
Current XML Pattern = First XML Pattern Object
1208
Current XML Expression = Top Level Expression in Pattern
1210
Evaluate XML Expression
1212
Match?
Yes
1214
Match All Patterns?
No
No
Yes
1218
More XML Pattern Objects?
No
Return Match Result
1216
Yes
1220
Current XML Pattern = Next XML Pattern Object

FIG. 12

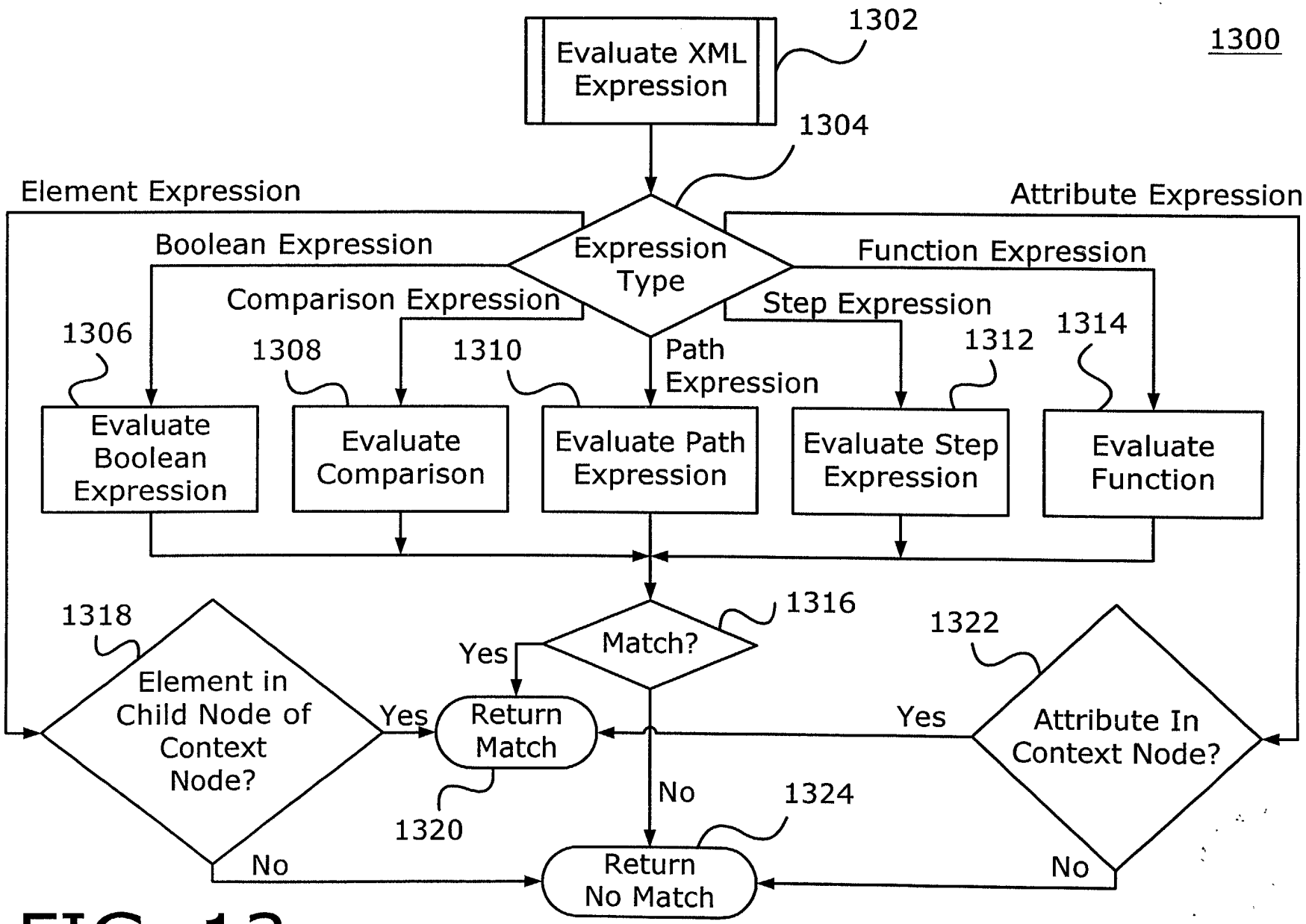

1300
1302
Evaluate XML Expression
1304
Expression Type
Element Expression
Attribute Expression
Boolean Expression
Comparison Expression
Step Expression
Function Expression
Path Expression
1306
1308
1310
1312
1314
Evaluate Boolean Expression
Evaluate Comparison
Evaluate Path Expression
Evaluate Step Expression
Evaluate Function
1316
Match?
Yes
1318
Element in Child Node of Context Node?
Yes
Return Match
1320
No
1322
Attribute In Context Node?
Yes
No
1324
Return No Match
No

FIG. 13

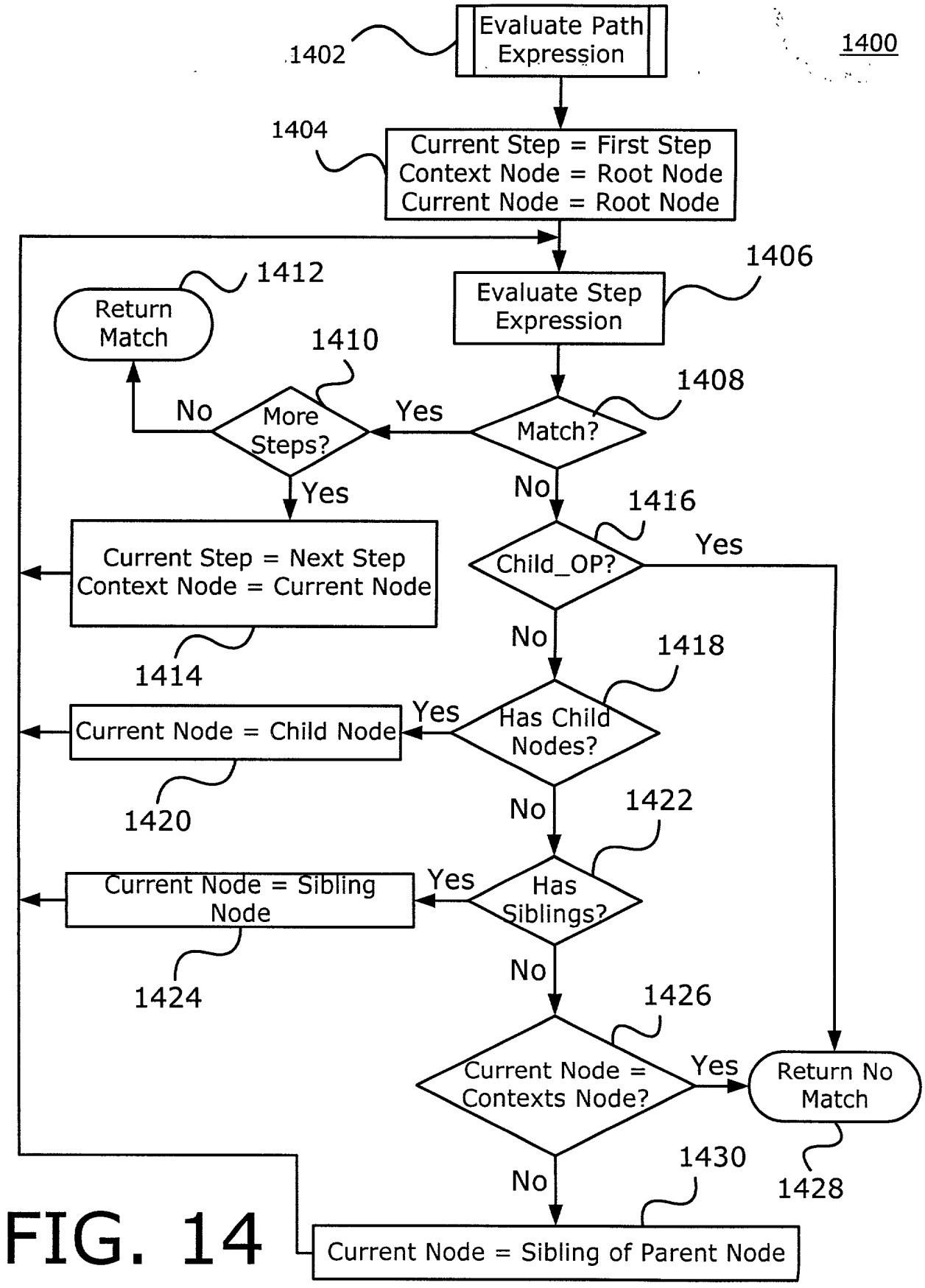

1400
1402
Evaluate Path Expression
1404
Current Step = First Step
Context Node = Root Node
Current Node = Root Node
1406
Evaluate Step Expression
1408
Match?
Yes
No
1410
More Steps?
No
Yes
1412
Return Match
Yes
Current Step = Next Step
Context Node = Current Node
1414
No
1416
Child_OP?
Yes
No
1418
Has Child Nodes?
Yes
Current Node = Child Node
1420
No
1422
Has Siblings?
Yes
Current Node = Sibling Node
1424
No
1426
Current Node = Contexts Node?
Yes
Return No Match
1428
No
1430
Current Node = Sibling of Parent Node

FIG. 14

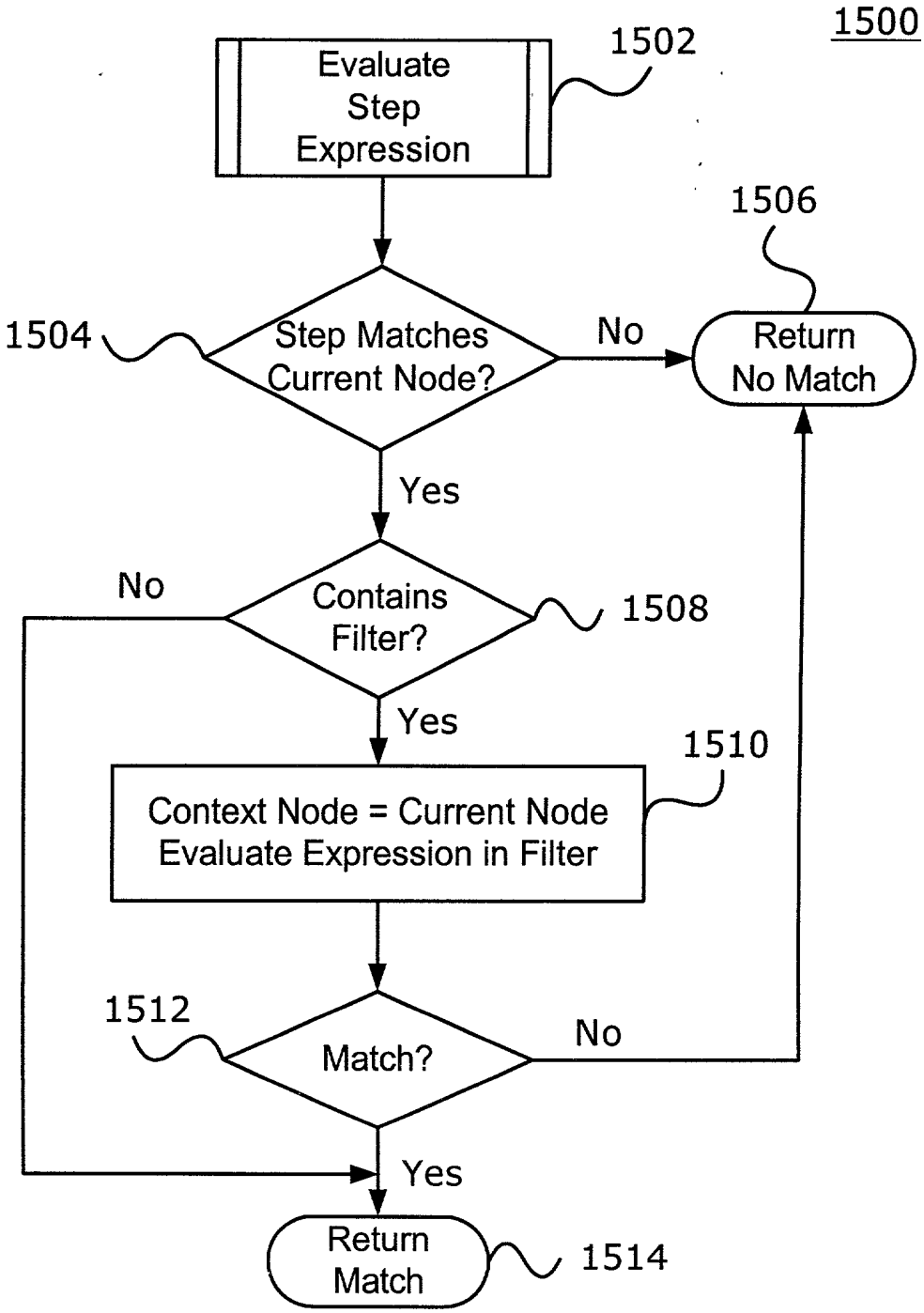

1500
Evaluate Step Expression
1502
1506
Step Matches Current Node?
1504
No
Return No Match
Yes
No
Contains Filter?
1508
Yes
1510
Context Node = Current Node
Evaluate Expression in Filter
1512
Match?
No
Yes
Return Match
1514

FIG. 15

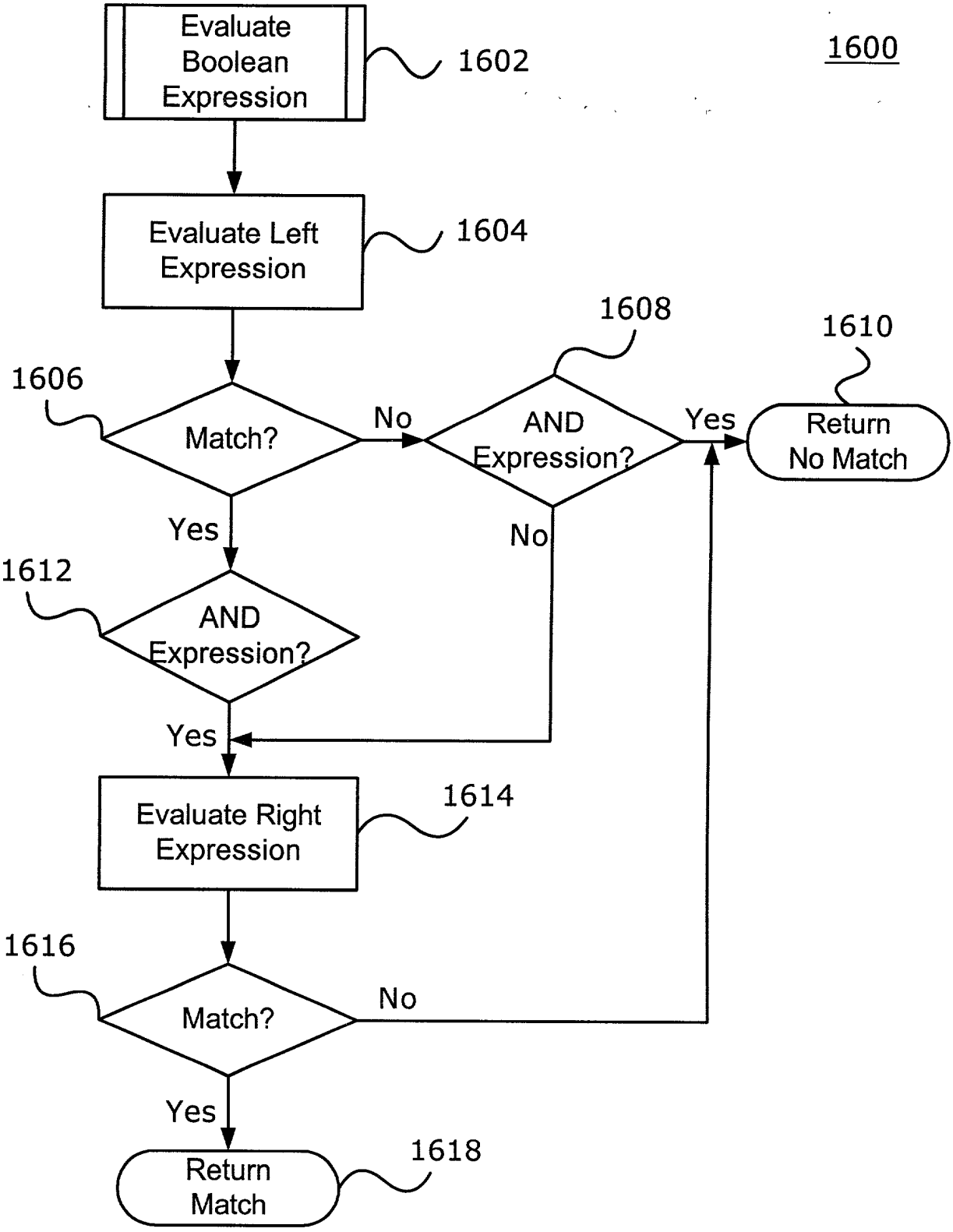

1600
Evaluate Boolean Expression
1602
Evaluate Left Expression
1604
1606
Match?
No
1608
AND Expression?
Yes
1610
Return No Match
Yes
No
1612
AND Expression?
Yes
Evaluate Right Expression
1614
1616
Match?
No
Yes
Return Match
1618

FIG. 16